



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Lynnfield Center Water District

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Lynnfield Center Water District
<i>PWS Address</i>	83 Phillips Road
<i>City/Town</i>	Lynnfield
<i>PWS ID Number</i>	3164000
<i>Local Contact</i>	Ken Burnham - Superintendent
<i>Phone Number</i>	(781) 334-3901

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

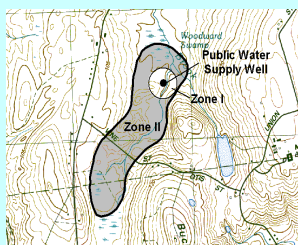
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Additional Resources Available for Source Protection
5. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 276

Susceptibility: Moderate

Well Names	Source IDs
Glen Drive Well #1	3164000-05G
Glen Drive Well #2	3164000-06G
Glen Drive Well #3	3164000-07G
Glen Drive Well #4	3164000-08G

Zone II #: 292

Susceptibility: High

Well Names	Source IDs
Phillips Tubular Wells	3164000-01G
Phillips Well #9	3164000-03G
Phillips Well #26	3164000-04G
Main Street G.P. Well	3164000-02G

The wells for the Lynnfield Center Water District are located within two separate water supply protection areas. The wells each have a Zone I radius of 400 feet, except for the Phillip Tubular Wells, which have a Zone I radius of 250 feet. The wells are located in aquifers with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map of the Zone II.

For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web at <http://www.epa.gov/safewater/ccr1.html>

Section 2: Discussion of Land Uses in the Protection Areas

The Zone IIs for Lynnfield Center are predominantly forested and residential, with a small amount of recreational land use (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

Key issues include:

1. Residential Land Uses and Activities
2. Presence of Oil or Hazardous Material Contamination Sites
3. Comprehensive Wellhead Protection Planning

The ranking of susceptibility to contamination for Lynnfield Center's Phillip and Main Street Wells is high, based on the presence of at least one high threat land use within the Zone II, as seen in Table 2. Whereas, the ranking of susceptibility to contamination for Lynnfield Center's Glen Drive Wells is moderate, based on the presence of at least one moderate threat land use within the Zone II, as seen in Table 2.

1. Residential Land Use - If managed improperly, household hazardous waste, septic systems, lawn care, and pet waste can all contribute to groundwater contamination. Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances.

If a septic system fails or is not properly maintained, it could be a potential source of microbial contamination. Fertilizers and pesticides contain hazardous chemicals that can travel through the soil and contaminate ground water if over-applied. Pet waste may contain bacteria, parasites, or viruses that pose a health risk. Water supplies may also be threatened from improper use or disposal of chemical products used in homes. Educating residents on proper disposal of these materials is the best defense against pollution.

Residential Recommendations - Household Hazardous Waste:

- ✓ **Proper Disposal** - Educate residents on the problem of disposing of hazardous materials in landfills, septic systems, wastewater treatment plants, storm drains, and on the ground. Encourage residents to participate in the Town of Lynnfield's annual Household Hazardous Waste Collection Day.
- ✓ **Alternative Products** - Provide residents with information on options that are available to substitute less hazardous substances for many products used in the home.

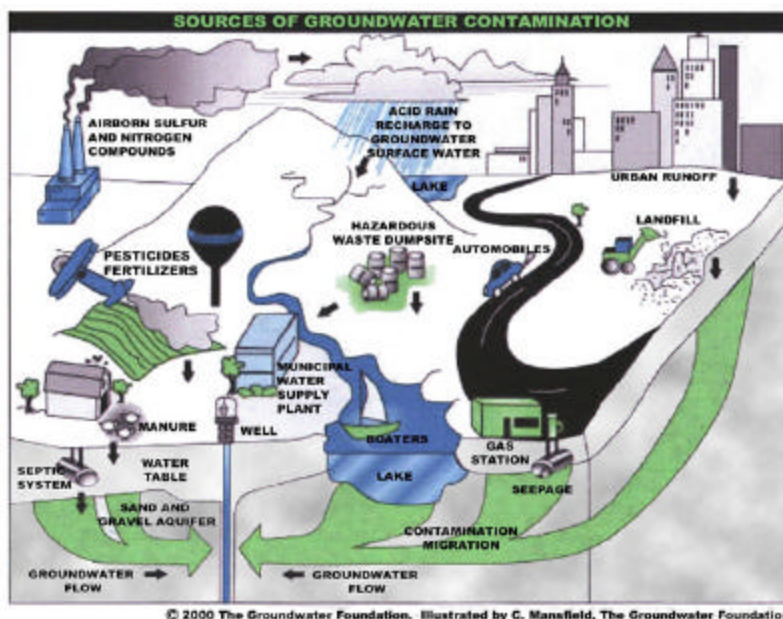
Residential Recommendations - Septic systems:

- ✓ **System Care** - Educate residents on private septic systems about using cleaning compounds that are safe for the septic system, on proper disposal practices, i.e. only sanitary waste in the septic system. Information on septic systems can be found at Massachusetts Department of Environmental Protection's website <http://www.state.ma.us/dep/brp/files/yoursyst.htm>.
- ✓ **Proper Disposal** - Residents should dispose of used oil, antifreeze, paints, and other household chemicals properly - not in septic systems.

Residential Recommendations - Lawn Care and Landscaping:

- ✓ **Environmentally Sound Lawn Care** - Provide educational materials to residents about the proper application of pesticides or fertilizers. Landscape with native

grasses, native flowering plants and trees and shrubs. Once established, native plants require less water and may not require fertilizer, herbicide or pesticide use. Encourage the use of native plants and landscaping by establishing a demonstration area at a town facility. Information on environmentally sound lawn care practices can be obtained from the Massachusetts Department of Food and Agriculture Pesticide Bureau's website at <http://www.massdfa.org>.



Residential Recommendations - Heating Oil Tanks:

- ✓ **Aboveground Storage Tanks** - Provide educational materials to residents regarding the proper storage of liquid petroleum products in aboveground storage tanks. The Department requires all Wellhead protection zoning and non zoning controls to prohibit the siting of liquid petroleum products storage in Zone II unless such storage is aboveground, on an impervious surface and either in a container or in an aboveground tank within a building, or in an area that has a containment system designed and operated to hold either 10 percent of the total possible storage capacity of all containers, or 110% of the largest container storage capacity whichever is greater.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.

Consult with the local fire department for any additional local code requirements regarding aboveground storage tanks. A fact sheet on basement or outside oil tank can be obtained from the Barnstable County Department of Health And Environment at <http://www.CapeCod.net/bcdhe/oil/oil.htm>.

2. Presence of Oil or Hazardous Material Contamination Sites – The Zone II contains DEP Tier Classified Oil and/or Hazardous Material Release Site indicated on the map as Release Tracking Number 3-0001019.

For more information refer to the attached map, Appendix C, and the Bureau of Waste Site Cleanup's website at <http://www.state.ma.us/dep/bwsc/sitelist.htm>

Oil or Hazardous Material Contamination Sites – Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or hazardous material contamination sites.



3. Comprehensive Wellhead Protection Planning - Protection planning prevents drinking water contamination by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are numerous resources available to help communities in developing a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ **Develop A Land Acquisition Plan** - Land acquisition projects protect water supplies by limiting the land development potential. Acquisitions can be accomplished by water systems through conservation restrictions, land banking, land purchases and land donations. Sample conservation restrictions are available at: <http://www.state.ma.us/dep/brp/dws/>. Future development of Zone II is a major concern. The Department recommends that the water district acquire Zone II land closest to the Zone I or land that is subject to high-risk development (refer to Developing a local Wellhead Protection Plan).
- ✓ **Local Controls** - Coordinate efforts with local officials in North Reading and Peabody to compare existing controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2). For more information on DEP land use controls see <http://www.state.ma.us/dep/brp/dws/>.
- ✓ **Inspection Program** - Develop and implement an Inspection Program for facilities that generate, use, store, or dispose of hazardous/toxic materials. Local Board of Health and Building Inspectors working on inspections often include floor drain and underground storage tanks. Local inspection programs can provide valuable technical assistance on Best Management Practices.

Other land uses and activities that may be potential contaminant sources include gas stations, stormdrains, and junk yards. Refer to Table 2 and Appendix 2 for more information about these land uses.

Identifying potential contaminant sources is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential contaminant sources are identified, specific recommendations like those below should be used to better protect the Lynnfield Center wells.

What are "BMPs?"

Best Management Practices are structural (i.e. oil & grease trap catch basins), nonstructural (i.e. hazardous waste collection days) or managerial measures that are used to protect and improve surface water and groundwater quality.

Section 3: Source Water Protection

Implementing source protection measures and Best Management Practices (BMPs) will reduce the Lynnfield Center Water District System's susceptibility to contamination.

Additional source protection recommendations are listed in Table 3 and the Key Issues above.

The Lynnfield Center Water District is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix 2: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II ID#	Potential Source of Contamination*
Commercial				
Gas Stations	1	H	292	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Golf Courses	1	M	276	Over-application or improper handling of fertilizers or pesticides
Residential				
Fuel Oil Storage (at residences)	Several	M	276, 292	Fuel oil: spills, leaks, or improper handling
Lawn Care/Gardening	Numerous	M	276, 292	Pesticides: over-application or improper storage and disposal
Septic Systems/Cesspools	Numerous	M	276, 292	Household hazardous waste: improper disposal, and microbial contaminants
Miscellaneous				
Aboveground Storage Tanks	Several	M	276	Materials stored in tanks: spills, leaks, or improper handling
NPDES Locations	1	L	292	Improper disposal of hazardous material and wastes
Oil or Hazardous Material Sites	1	----	292	Oil or hazardous materials and waste: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	Numerous	L	276	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Underground Storage Tanks	1	H	292	Spills, leaks, or improper handling stored materials
Water Treatment Sludge Lagoon	1	M	292	Improper management of sludge and wastewater
Water Supply Protection Area % that is Sewered = 0%				
Notes:				
1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.				
2. For more information on regulated facilities, refer to Appendix 3: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.				
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.				
* THREAT RANKING - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.				

- ❖ Adopting, through a Zoning Bylaw, a Groundwater Protection Overlay District that meets current MA Wellhead Protection Regulations 310 CMR 22.21(2). The watershed protection district covers more land than the delineated Zone II.
- ❖ The Lynnfield Center Water District owns approximately 1000 acres of watershed land.
- ❖ Working with the town to actively maintain stormdrain systems. Catch basins are designed with sumps in order to prevent hazardous materials from entering the drainage system. The Town also has an aggressive emergency response and spill control program.
- ❖ Providing material to consumers on conservation, and sound lawncare practices.

Appendix 1 includes specific recommendations for each of the following:

➤ **Partner with Local Businesses:**

Since many small businesses and industries use hazardous materials and produce hazardous waste products, it is essential to educate the business community about drinking water protection. Encouraging partnerships between businesses, water suppliers, and communities will enhance successful public drinking water protection practices.

➤ **Provide Outreach to the Community:**

Public education and community outreach ensure the long-term protection of drinking water supplies. Awareness often generates community cooperation and support. Residents and business owners are more likely to change their behavior if they know where the wellhead protection recharge area is located; what types of land uses and activities pose threats; and how their efforts can enhance protection.

➤ **Plan for the Future:**

One of the most effective means of protecting water supplies is planning, such as the adoption of local controls to protect watersheds and ground water. These controls may include health regulations, general ordinances, and zoning bylaws that prohibit potential sources of contamination from wellhead protection areas.

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. These recommendations are only part of your ongoing local drinking water source protection.

Section 4: Additional Resources Available for Source Protection

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community.

The assessment and protection recommendations in this SWAP report are provided as a tool to spur community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities.

The Lynnfield Center Water District should supplement this SWAP report with local information on potential sources of contamination and land uses. To aid in the protection of the wells, local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Funding Resources:

The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing Water Supply Source Protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. For additional information, please refer to the program fact sheet from this year. Please note: each spring DEP posts a new Request for Response for the Grant program (RFR).

The Aquifer Land Acquisition Program protects both surface and groundwater used for drinking water purposes. Land acquisition is considered to be the single best way to protect a drinking water supply. Land acquisitions for water supply protection purposes include outright purchases, conservation restrictions, land donations, and interest in land taken by eminent domain. These funds will be available to water suppliers and municipal governments through the process described below.

All publicly owned water suppliers, districts, or municipalities are invited to express an interest by submitting a Statement of Need covering any land purchase expected to be made to protect a public water supply that can be completed by June 30, 2002. The Department of Environmental Protection will select respondents of the Draft Statement of Need to submit a completed Final Statement of Need based on DEP land acquisition standard operating procedures, ability to use the funds by June 30, 2002, and other environmental criteria as determined necessary by the Secretary and Commissioner.

For further information on the Aquifer Land Acquisition Program, contact Joseph McNealy, Director of Program Development, Department of Environmental Protection, at (617) 556-1068.

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, Aquifer Land Acquisition Program, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://www.state.ma.us/dep/brp/mf/mfpubs.htm>.

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

For More Information

Contact Anita Wolovick in DEP's Wilmington Office at (978) 661-7768 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, town boards, and the local media.

Section 5: Appendices

1. Protection Recommendations
2. Regulated Facilities within the Water Supply Protection Area
3. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
4. Additional Documents on Source Protection in Lynnfield

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Monitor for non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21 (2)?	YES	Monitor activities in Zone II to assure compliance with local wellhead protection controls.
Do neighboring communities protect the Zone II areas extending into their communities?	Unknown	Request that municipal officials in North Reading and Peabody develop land use restrictions that meet 310 CMR 22.21(2).
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish a committee that includes representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	The town is encouraged to continue this program, and to include municipal facilities. For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc .
Does the PWS provide wellhead protection education?	Some	Currently, the only outreach is through the annual Consumer Confidence Report, and by providing lawncare fact sheets. Increase residential outreach through bill stuffers, school programs, Drinking Water Week activities, and coordination with local groups. Aim additional efforts at commercial and municipal uses within the Zone II.

APPENDIX A: DEP PERMITTED FACILITIES WITHIN LYNNFIELD'S WATER SUPPLY PROTECTION AREAS

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
262894	PUMP 'N PANTRY MOBIL	793 MAIN STREET	LYNNFIELD	FUEL DISPENSER	FUEL DISPENSER

UNDERGROUND STORAGE TANKS

FACILITY NAME	ADDRESS	TOWN	DESCRIPTION	CAPACITY (GAL)	CONTENTS
PUMP 'N PANTRY MOBIL	793 MAIN STREET	LYNNFIELD	GAS STATION	12000	GASOLINE
PUMP 'N PANTRY MOBIL	793 MAIN STREET	LYNNFIELD	GAS STATION	12000	GASOLINE
SAGAMORE SPRING GOLF CLUB	1287 MAIN STREET	LYNNFIELD	GOLF CLUB	2000	GASOLINE

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities located within the water supply protection area(s) should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within Lynnfield Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
3-0001019	793 Main Street	Lynnfield	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.